



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
[www.uspto.gov](http://www.uspto.gov)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/075,106	02/13/2002	John Robert Smith	H-204604	6949

7590 06/09/2004  
**CARY W. BROOKS**  
General Motors Corporation  
Legal Staff, Mail Code 482-C23-B21  
P.O. Box 300  
Detroit, MI 48265-3000

EXAMINER

BAREFORD, KATHERINE A

ART UNIT PAPER NUMBER

1762

DATE MAILED: 06/09/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/075,106

Applicant(s)

SMITH ET AL.

Examiner

Katherine A. Bareford

Art Unit

1762

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 21 May 2004.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-13, 15 and 16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

*Claim 14 is canceled*

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a). Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Continued Examination Under 37 CFR 1.114*

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on May 6, 2004 (certificate of mailing date May 3, 2004) has been entered.

The amendment filed May 21, 2004 in response to the Notice of Non-compliant amendment mailed May 13, 2004 has been received and entered.

As a result of the amendment, claims 1-13 and 15-16 are examined.

### *Claim Objections*

2. Claim 16 is objected to because of the following informalities: at claim 16, lines 18-20 it is required that "the ferrous-based coating includes an embrittlement-reducing addition consisting essentially of: yttrium, calcium, titanium, zirconium, hafnium, cerium and lanthanum and mixtures thereof". It appears that applicant means that one or more of the listed materials is present. However, as worded it appears that all of the materials must be present.

Appropriate correction is required.

### *Claim Rejections - 35 USC § 102*

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1-13 and 15-16 are rejected under 35 U.S.C. 102(e) as being anticipated by Byrnes et al (US 6610369).

The applied reference has a common inventors (Larry Byrnes and Martin Kramer) with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

Byrnes teaches the method of thermally spray coating a cylinder wall of a metal engine block by advancing a feed wire of a ferrous based material into an HVOF device, supplying a high velocity jet flow of gaseous fuel to the high temperature zone of the HVOF device, supplying a high velocity jet flow of oxygen to the high temperature zone of the HVOF device, combusting the oxygen and fuel to generate sufficient heat in the high temperature zone to melt the tip end of the feed wire in the high temperature zone and spraying the molten feed wire material onto the cylinder wall surface of the engine block to form a ferrous based coating thereon. Claim 1 and

column 1, lines 30-50. Byrnes also teaches controlling the flow of oxygen relative to the flow of gaseous fuel to provide an oversupply of oxygen in excess of the oxygen required for stoichiometric combustion of the gaseous fuel, and reacting the excess oxygen with an associated fraction of the wire feed material in the high temperature zone to combust the associated fraction of the wire feed material as a source of solid fuel to provide a supplemental source of heat to the high temperature zone of the HVOF device, and where the amount of oversupply of oxygen is sufficient to increase the deposition rate of the molten metal on the cylinder wall by more than twofold than that deposited when oxygen is supplied at the level required for stoichiometric combustion of the gaseous fuel. Claim 1 and column 1, lines 30-50. Byrnes also teaches that the ferrous based coating can include an addition of at least one of: yttrium, calcium, magnesium, titanium, zirconium, hafnium, cerium and lanthanum. Column 2, lines 35-45 and column 5, lines 35-60.

Claim 2: oxygen is oversupplied in an amount of at least twice that needed for stoichiometric combustion with the fuel. See claim 2, column 6, lines 28-31.

Claim 3: the ferrous-based coating can include additions of aluminum. Column 2, lines 25-35.

Claim 4: the aluminum can be added in an amount ranging from about 0.5 to 3.0 wt% of the ferrous-based coating. See claim 9, column 7, lines 10-15.

Claim 5: the aluminum can be present in the range of 1.5 to 2.5 wt%. See claim 10, column 7, lines 12-15.

Claim 6: the aluminum reacts in the HVOF device with the ferrous based coating to produce  $\text{FeAl}_2\text{O}_4$  in the applied coating. See claim 11, column 8, lines 1-5.

Claim 7: the additive material is present in an amount equal to about 1 wt% or less of the ferrous based coating. Column 5, lines 50-55.

Claim 8: the additive material reacts with impurities in the coating to bind and prevent the impurities from segregating to grain boundaries and interfaces of the coating. Column 5, lines 35-45 and column 2, lines 35-45.

Claim 9: the additive material reacts with any sulfur to prevent sulfur embrittlement of the applied coating. Column 5, lines 35-60 and column 2, lines 35-45.

Claims 10-11: the metal engine block can be aluminum or magnesium or alloys thereof. Claim 5, column 6, lines 35-40.

Claims 12-13: the gaseous fuel can be methane or propane. Claim 6, column 6, lines 40-42.

Claim 15: the coating can be without the addition of magnesium. Column 5, lines 45-50 (magnesium is an optional addition).

Claim 16: the method as in claim 1 can include an embrittlement reducing addition consisting essentially of: yttrium, calcium, titanium, zirconium, hafnium, cerium and lanthanum and mixtures thereof. Column 5, lines 45-50 (the magnesium is an optional addition, and therefore does not have to be present).

5. Applicant's arguments with respect to claims 1-13 and 15-16 have been considered but are moot in view of the new ground(s) of rejection.

Applicant's arguments, filed with the after final amendment of April 19, 2004, argue that the reference to Byrnes and Rabiei do not teach or suggest that magnesium could be added to a ferrous based feed wire and thermally spray the same using an oversupply of oxygen in excess to the oxygen required for the stoichiometric combustion of the gaseous fuels, to increase the deposition rate of a molten metal on a cylinder wall by more than two fold than that deposited when oxygen is supplied at the stoichiometric rate as recited in claim 1. Furthermore, applicant argues that new claims 15-16 which eliminate magnesium from the group of additives would not be obvious using Rabiei, which suggests magnesium but none of the other potential additives.

The Examiner notes these arguments, but notes that after a review of the references the Examiner finds that Byrnes teaches all the features now required by the claims, as indicated in the 35 USC 102(e) rejection using Byrnes above.


### *Conclusion*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Katherine A. Bareford whose telephone number is (571) 272-1413. The examiner can normally be reached on M-F(6:30-4:00) with the First Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shrive P. Beck can be reached on (571) 272-1415. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9306 for regular communications and for After Final communications.

Other inquiries can be directed to the Tech Center 1700 telephone number at (571) 272-1700.

Furthermore, information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
KATHERINE A. BAREFORD  
PRIMARY EXAMINER  
GROUP 4400-1700